

ATTACHMENT E

TECHNICAL MEMORANDUM

***IN RIVER, FLOODWATER, AND TURF MAT
SAMPLING AND ANALYSIS***



Technical Memorandum

DATE: August 29, 2006
PROJECT: ATSTR

TO: Phil Simon – ATS, Inc.

FROM: BB/CW/TD

CC: Jim Braithwaite –
Vector Resolutions

SUBJECT: In-River, Floodwater and Turf Mat Sampling and Analysis

Introduction

Sampling for analysis of dioxins and furans was conducted on the Tittabawassee River and floodplain during two spring 2006 flood events, occurring in March and May. Three types of samples were collected: samples of surface water suspended solids in the channel at bridges, surface water suspended solids samples taken from floodplain overland flow, and samples of flood-deposited sediment on the floodplain. A brief description of the samples, sampling procedures and results is presented below, with summary tables and figures attached at the end of this memo.

In-River Samples. Surface water samples were collected at two bridge locations (Currie Parkway and Center Road) during both the March (3/10-20/06) and May (5/12-19/06) flood events. The sampling locations are shown on Figure 1: Sample Location Map. Hydrographs of river discharge during the two flood events at the USGS gage in Midland, Michigan are presented as Figure 2. The samples were collected at three equal discharge increment locations along the river bridge transect and composited into one sample container. Samples were collected using a depth-integrated water sampling device (DH-76 sampler) to provide a vertically representative sample of the water column.

In-river samples for chlorinated dioxins and furans were extracted as "whole water" samples, and the results are calculated on the basis of the total solids content of the water sample. Therefore, the results represent the aggregate of the dissolved and particulate fractions. The results for the 17 regulated dioxin/furan congeners and derived TEQ's (WHO, 2005), are presented in Tables 1 and 2 for the March and May events, respectively. Except as noted, all results are reported on a dry weight basis.

Floodwater Samples. Overland flow surface water samples were collected at eight sites in three floodplain locations (Study Area 1, Imerman Park and Shiawassee National Wildlife Refuge) during the March 2006 flood event. These locations are shown on Floodplain Sampler Location Figures 3 to 5. The samples were collected using peristaltic pumps controlled by electronic switches that activated the pump when overland flow rose to the appropriate level, and deactivated the pump when the sampling container was full. Samples were retrieved after flood waters receded enough to safely access each location.

Floodwater samples for chlorinated dioxins and furans were extracted as "whole water" samples and the results are calculated on the basis of the total solids content of the water sample. Therefore, the results represent the aggregate of the dissolved and particulate fractions. The results for the 17 regulated dioxin/furan congeners and derived TEQ's (WHO, 2005) are presented in Table 3. Except as noted, all results are expressed on a dry weight basis.

Deposited Sediment Samples. Flood-deposited sediment samples (turf mat samples) from the March 2006 flood event were collected at 48 sites in eight floodplain locations (Caldwell Boat Launch Area, Study Area 1, Freedom Festival Park, Imerman Park, Saginaw Township Landfill/Center Road Boat Launch Area, Shiawassee National Wildlife Refuge, MDNR Property North of Greenpoint Island, and Greenpoint Island). These locations are shown on the Clay Marker Pad and Turf Mat Location Maps (Figures 6 to 12). The samples were collected on 20-inch squares of synthetic carpet (i.e., Astro-turf or turf mat) that were secured to the ground with metal stakes. The turf mats with deposited sediments were collected and placed into large Ziploc bags.

The results for the 17 regulated dioxin/furan congeners and derived TEQ's (WHO, 2005) are presented in Table 4. Except as noted, all results are expressed on a dry weight basis.

Clay marker pads are also used in the contaminant deposition study and consist of a 2 foot by 2 foot square of feldspar installed on the floodplain floor. They are used to establish a reference stratum or marker horizon at the soil surface against which future measurements of solids deposition can be made. The clay pad samples were collected manually using a 3/4-inch diameter stainless steel Shelby-type tube sampler with an opening allowing visual observation of the core along its length. The thickness of any deposited sediments above the feldspar horizon is measured and documented along with other pertinent observations. Clay marker pads are co-located with turf mat locations, as shown in Figures 6-12.

The clay pad measurements from spring 2006 are included in Table 4.

Shipping and Sample Handling. All samples were submitted under chain-of-custody to Alta Analytical (El Dorado, California) for analysis of chlorinated dioxins and furans, and Gulf Coast Analytical (Baton Rouge, Louisiana) for the other parameters. Water samples were stored after collection in an iced cooler or refrigerator and shipped to the laboratory on the day following collection using an overnight courier. Turf mat sediment samples were transported in coolers to LTI facilities and stored in a freezer until shipment to the laboratory via overnight courier. Each mat sample received at Alta Analytical was stored and dried in its original Ziploc bag to maintain the integrity of the sample. Each bag was placed in a drying cabinet and kept open to air-dry. Once completely dry, the mat was removed from the bag and shaken directly into a No. 5 (4 mm) sieve. To remove as much sample as possible, a chemist wearing clean nitrile gloves tapped the back of the mat and removed any remaining debris manually. All sample removed from the mat was sieved and collected in a clean Pyrex pan. Extraneous leaves, sticks, or other debris were discarded. Only turf mats containing greater than 1 gram of deposited material were analyzed.



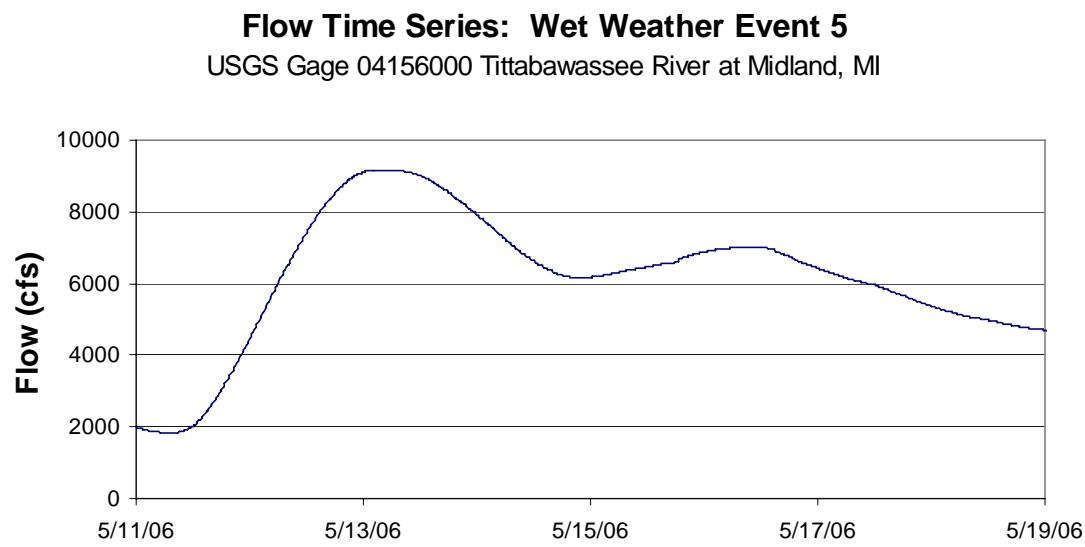
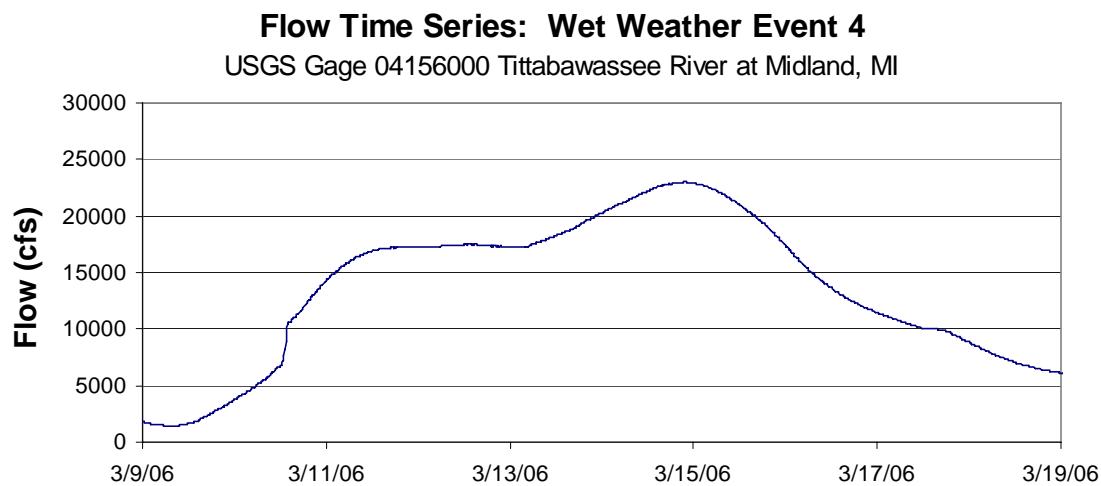
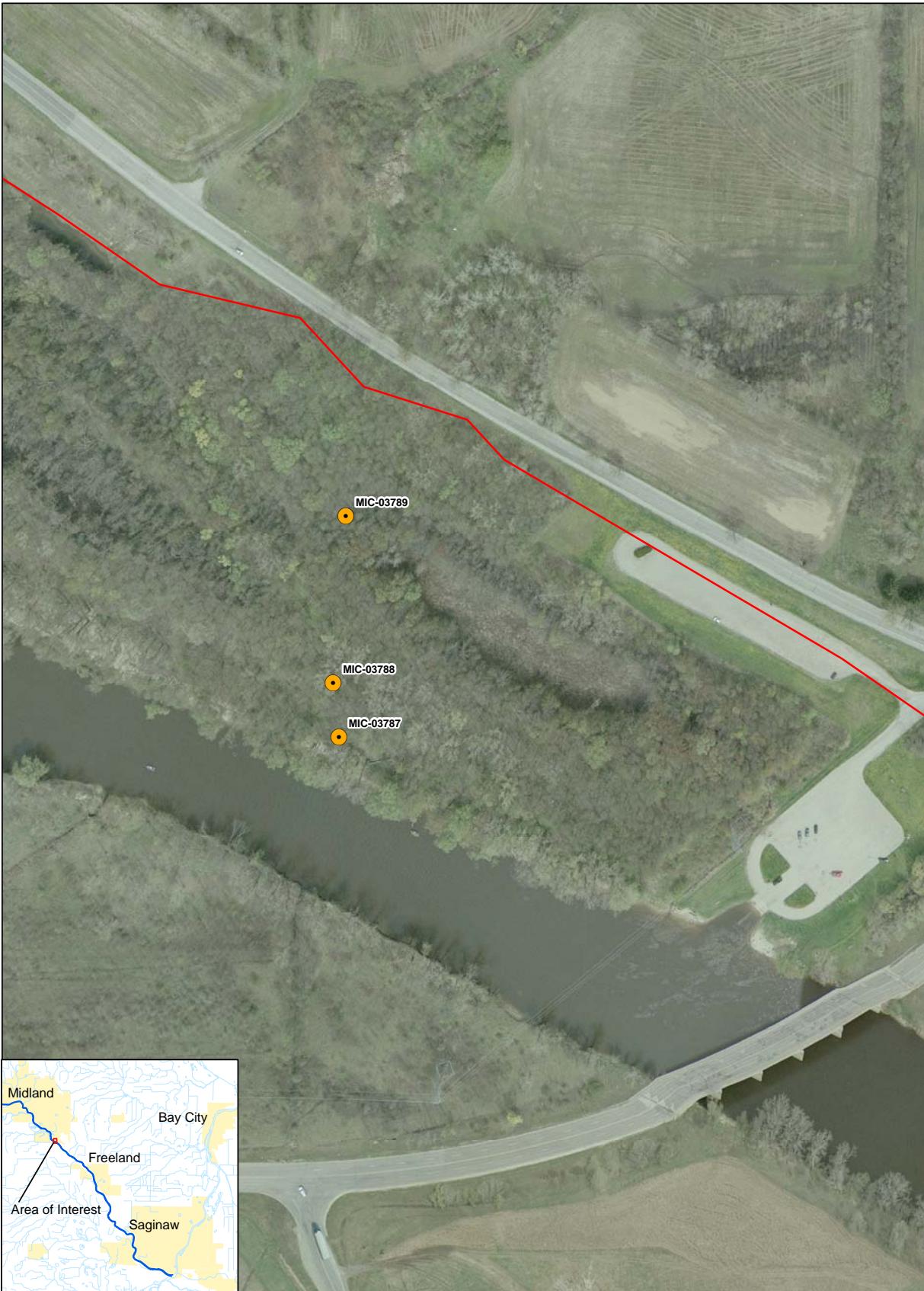


Figure 2. Flow Time Series for Wet Weather Events (March 2006 and May 2006)



LEGEND

- Floodplain Sampler Location
- Approximate 100 year Floodplain

Tittabawassee River and Floodplain

FIGURE 3
FLOODPLAIN SAMPLER LOCATIONS
NEAR CALDWELL BOAT LAUNCH

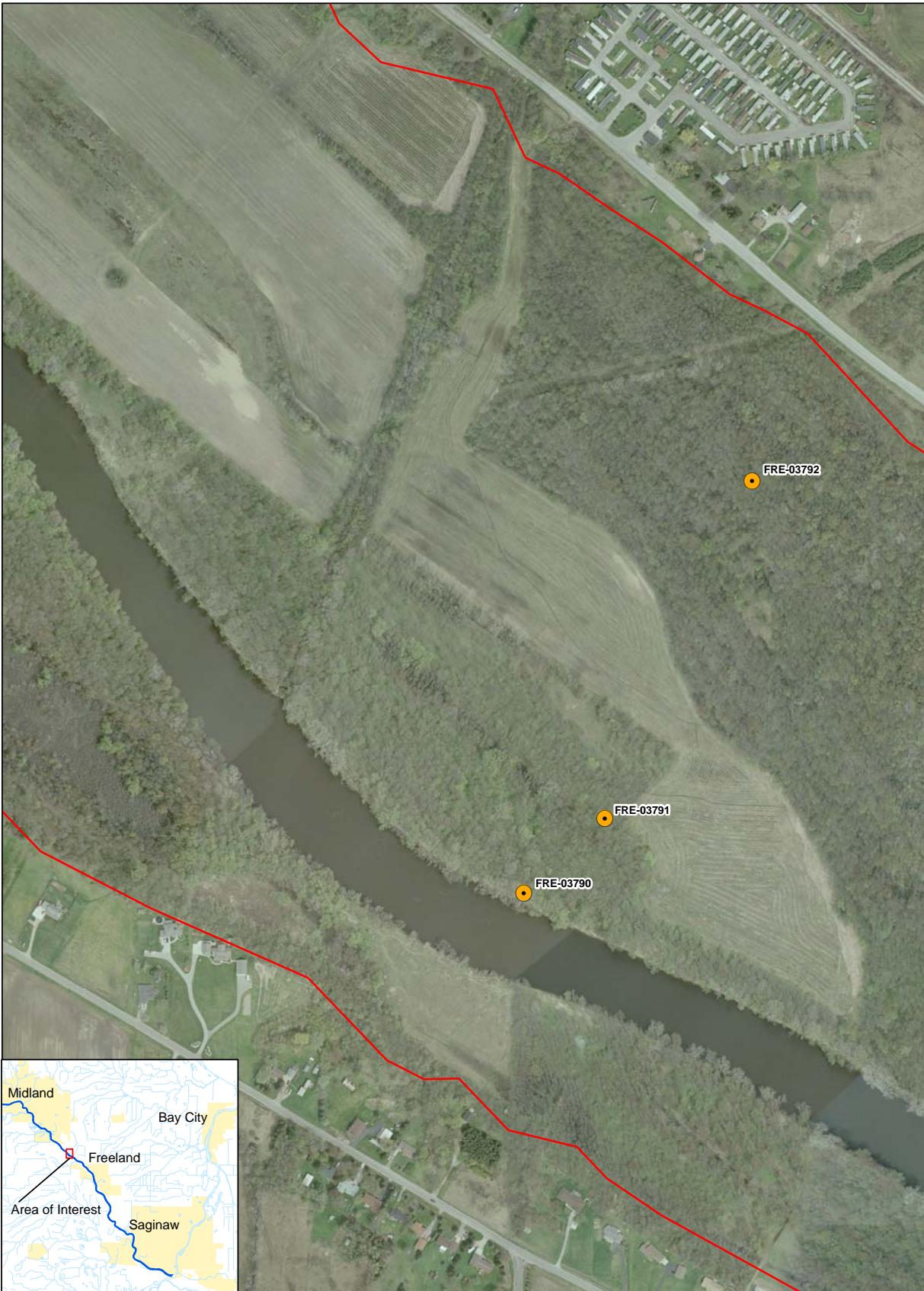


N

0 25 50 Meters

0 100 200 Feet





LEGEND

- Floodplain Sampler Location
- Approximate 100 year Floodplain



0 50 100
Meters

0 250 500
Feet

FIGURE 4
FLOODPLAIN SAMPLER LOCATIONS
AT DOW PROPERTY AT RIVER MILE 17.5





LEGEND

- Floodplain Sampler Location
- Approximate 100 year Floodplain

Tittabawassee River and Floodplain

FIGURE 5
FLOODPLAIN SAMPLER LOCATIONS
AT IMERMAN PARK



0 50 100

Meters

0 250 500

Feet





LEGEND

- Clay Marker Pad
- Turf Mat

Tittabawassee River and Floodplain

FIGURE 6
CLAY MARKER PAD AND TURF MAT
LOCATION MAP FOR DOW PROPERTY
NEAR CALDWELL BOAT LAUNCH

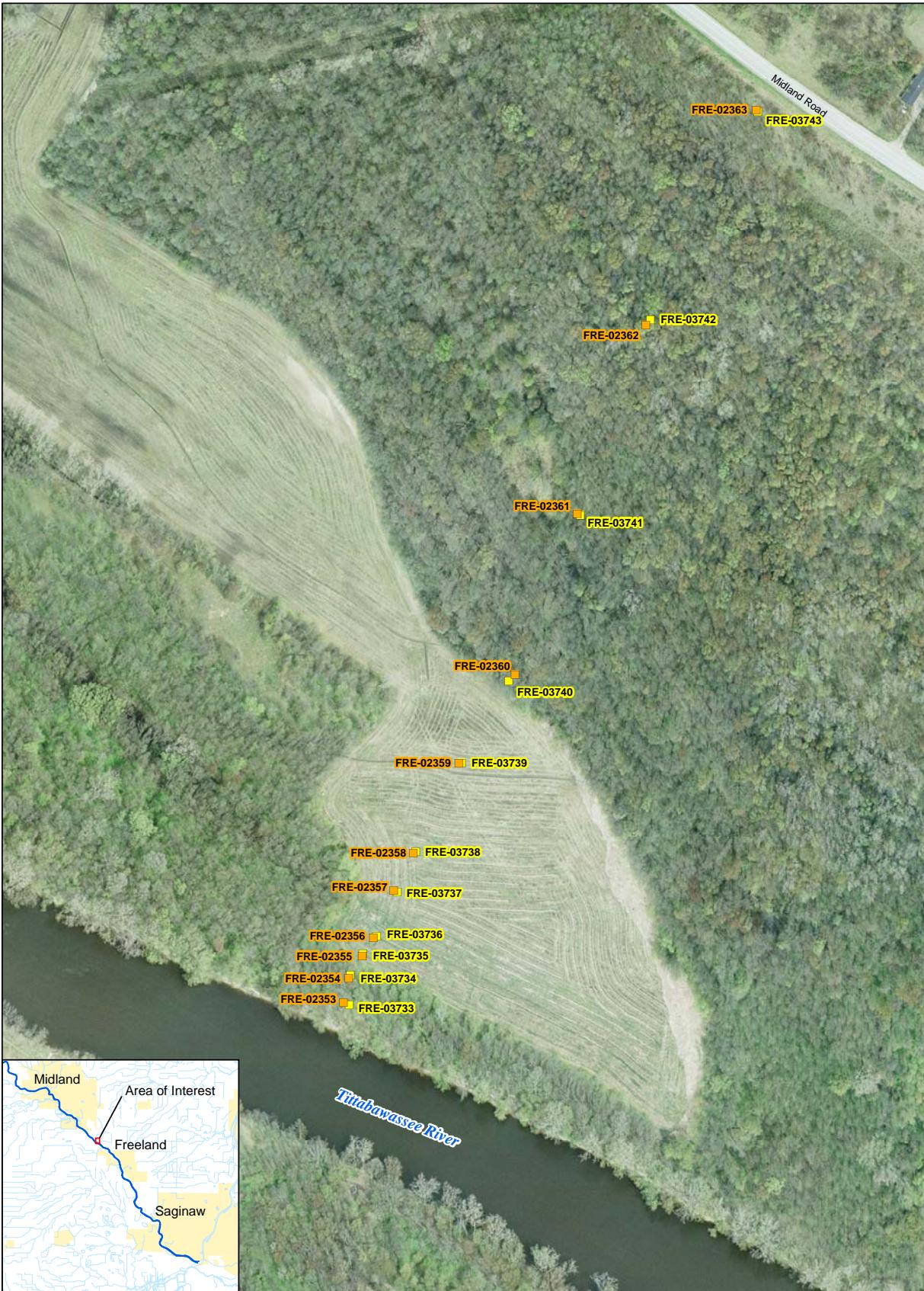


N

0 50 Meters

0 50 100 150 Feet





LEGEND

- Clay Marker Pad
- Turf Mat



0 25 50 100
Meters

0 100 200 400
Feet

Tittabawassee River and Floodplain

FIGURE 7
CLAY MARKER PAD AND TURF MAT
LOCATION MAP FOR DOW PROPERTY
NEAR ROCKWELL DRIVE





LEGEND

- Clay Marker Pad
- Turf Mat



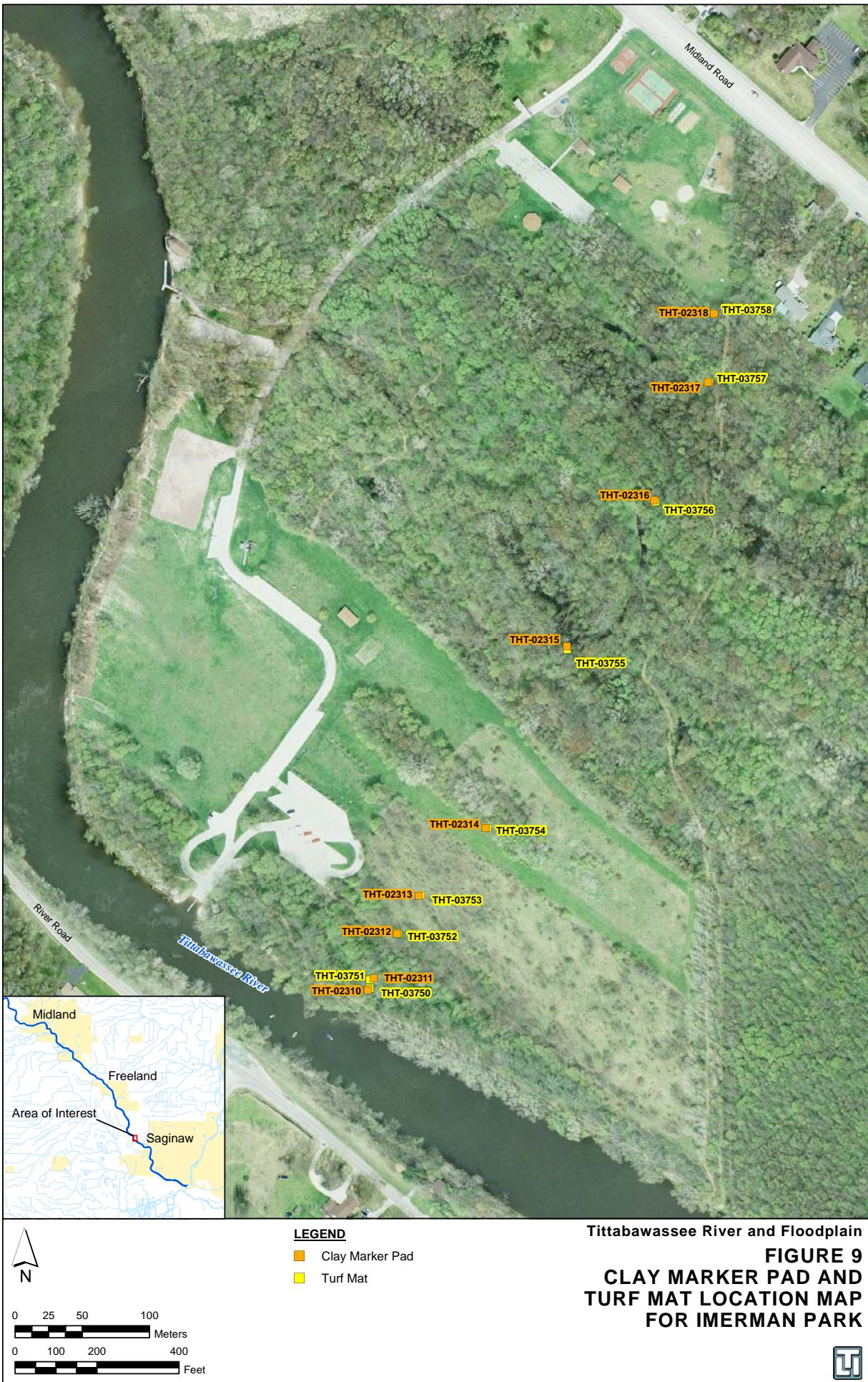
0 25 50 Meters

0 100 200 Feet

Tittabawassee River and Floodplain

FIGURE 8
CLAY MARKER PAD AND
TURF MAT LOCATION MAP
FOR FREELAND FESTIVAL PARK







LEGEND

- Clay Marker Pad
- Turf Mat



0 25 50 Meters
0 100 200 Feet

Tittabawassee River and Floodplain

FIGURE 10
CLAY MARKER PAD AND
TURF MAT LOCATION MAP
FOR SAGINAW TWP. LANDFILL





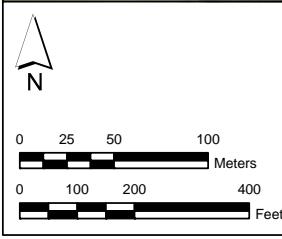


Table 1. March 2006 Wet Weather Sampling (3/10/06 - 3/20/06)
Bridge Sample Results (ng/Kg; Replicates Averaged, ND = 1/2 DL)

CAS Number	Parameter Name	WHO 2005 TEF	Reach	above Reach A	VV
			Station		1145+50
			Location ID	TRU-02188	SHL-02193
CAS Number	Parameter Name	WHO 2005 TEF	Sample Date	Currie Parkway	Center Road
TEQ	TEQ		03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	1.0 1.1 1.7 0.9 0.6	17.1 22.2 35.3 19.1 18.3
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	1.0	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.1 U 0.2 U 0.2 U 0.2 U 0.2 U+U	0.3 U 0.4 U 0.8 J 0.3 U 0.4 U+J
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	0.1	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.4 J 0.2 U 0.2 U 0.2 U 0.2 U+U	32.6 J 54.1 J 93.0 J 41.6 U 33.3 U+U+J
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	1.0	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.2 U 0.3 U 0.3 U 0.2 U 0.2 U+U	0.9 J 0.5 J 0.7 J 0.2 U 0.4 U+U+J
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.03	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.3 J 0.1 U 0.3 U 0.2 U 0.1 U+U	17.6 22.9 42.2 22.5 20.8 U
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.3	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.4 J 0.1 U 0.7 J 0.2 U 0.1 U+U	14.3 22.0 32.8 18.6 18.7 J
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	0.1	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.1 U 0.2 U 0.3 U 0.3 U 0.2 U+U	0.7 J 0.4 J 0.5 J 0.3 U 0.3 U+U+U
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.1	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	1.2 J 1.1 J 1.1 J 0.3 U 0.1 U+U	15.0 19.7 30.8 18.1 18.8 J
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.1	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.6 J 0.7 J 1.1 J 0.3 U 0.2 U+U	3.0 J 1.5 J 2.6 J 1.7 U 1.0 J+J+U
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.1	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.2 U 0.4 J 0.3 U 0.2 U 0.1 U+U	4.2 J 4.6 J 7.8 4.2 J 3.8 J+J+U
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.1	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.5 J 0.6 J 1.0 J 0.5 U 0.2 U+U	1.5 J 0.8 J 1.1 J 0.7 U 0.3 U+U+U
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.1	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.0 U 0.1 U 0.2 U 0.3 U 0.2 U+U	0.6 J 0.6 J 2.0 J 1.7 U 4.1 J+J+J
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.01	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.4 J 0.5 J 0.6 J 0.2 U 0.1 U+U	2.7 J 2.7 J 4.3 J 3.0 J 3.0 J+J+J
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	0.01	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	9.2 10.2 15.9 14.1 4.2 J+J	70.9 32.2 48.9 48.0 31.8
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.01	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	3.1 J 4.3 J 5.8 2.4 U 1.1 U+J	90.0 38.3 50.4 48.3 29.7 U
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.01	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	0.4 J 0.4 J 0.9 J 0.2 U 0.2 U+U	3.6 J 2.9 J 4.7 J 3.6 J 2.2 U+U+J
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	0.0003	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	61.7 69.8 105.0 90.9 23.0 U	871.0 310.0 446.0 447.0 302.3
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	0.0003	03/10/06 03/11/06 03/14/06 03/16/06 03/20/06	6.6 6.7 J 9.5 6.5 J 1.8 U+J	167.0 77.8 118.0 113.0 78.9

U: nondetect result

J: estimated result

+: combines qualifiers from replicate results

Table 2. May 2006 Wet Weather Sampling (5/12/06 - 5/19/06)
In-River Suspended Solids Sample Results (ng/Kg; Replicates Averaged, ND = 1/2 DL)

CAS Number	Parameter Name	WHO 2005 TEF	<i>Reach</i>	<i>above Reach A</i>	<i>VV</i>
			<i>Station</i>	1145+50	
			<i>Location ID</i>	TRU-02188	SHL-02193
<i>TEQ</i>	<i>TEQ</i>		05/12/06	0.2	27.9
			05/13/06	0.2	10.3
			05/15/06	0.3	7.5
			05/19/06	0.3	8.4
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	1.0	05/12/06	0.0 U	0.5 U
			05/13/06	0.1 U	0.3 J
			05/15/06	0.1 U+U	0.2 J
			05/19/06	0.1 U	0.1 U
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	0.1	05/12/06	0.1 U	59.0
			05/13/06	0.1 U	22.7
			05/15/06	0.2 U+J	17.2
			05/19/06	0.1 U	17.7
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	1.0	05/12/06	0.0 U	1.1 J
			05/13/06	0.1 U	0.3 J
			05/15/06	0.1 U	0.1 U
			05/19/06	0.1 U+U	0.1 U
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.03	05/12/06	0.0 U	32.3
			05/13/06	0.0 U	11.6
			05/15/06	0.1 U+U	7.4
			05/19/06	0.1 U	10.0
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.3	05/12/06	0.0 U	27.0
			05/13/06	0.0 U	9.6
			05/15/06	0.1 U+U	7.3
			05/19/06	0.1 U	8.5
39227-28-6	1,2,3,4,7,8-HEXAChLORODIBENZO-p-DIOXIN	0.1	05/12/06	0.1 U	0.3 U
			05/13/06	0.1 U	0.2 J
			05/15/06	0.1 J+U	0.1 U
			05/19/06	0.1 U	0.1 U
70648-26-9	1,2,3,4,7,8-HEXAChLORODIBENZOFURAN	0.1	05/12/06	0.2 J	28.1
			05/13/06	0.1 U	9.6
			05/15/06	0.2 J+U	7.2
			05/19/06	0.2 J	8.3
57653-85-7	1,2,3,6,7,8-HEXAChLORODIBENZO-P-DIOXIN	0.1	05/12/06	0.1 U	2.5 J
			05/13/06	0.0 U	1.0 J
			05/15/06	0.1 J+U	0.7 J
			05/19/06	0.1 J	0.7 J
57117-44-9	1,2,3,6,7,8-HEXAChLORODIBENZOFURAN	0.1	05/12/06	0.0 U	6.4
			05/13/06	0.0 U	2.4 J
			05/15/06	0.1 U+U	1.8 J
			05/19/06	0.0 U	2.0 J
19408-74-3	1,2,3,7,8,9-HEXAChLORODIBENZO-P-DIOXIN	0.1	05/12/06	0.1 U	1.3 J
			05/13/06	0.1 U	0.5 J
			05/15/06	0.2 J+U	0.3 J
			05/19/06	0.1 U	0.1 U
72918-21-9	1,2,3,7,8,9-HEXAChLORODIBENZOFURAN	0.1	05/12/06	0.0 U	0.3 U
			05/13/06	0.1 U	1.8 J
			05/15/06	0.1 U+U	1.3 J
			05/19/06	0.1 U	1.9 J
60851-34-5	2,3,4,6,7,8-HEXAChLORODIBENZOFURAN	0.01	05/12/06	0.0 U	3.7 J
			05/13/06	0.0 U	1.2 J
			05/15/06	0.1 U+J	1.1 J
			05/19/06	0.0 U	1.2 J
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	0.01	05/12/06	1.1 J	41.1
			05/13/06	1.4 J	15.9
			05/15/06	1.4 J+J	10.6
			05/19/06	1.2 J	12.8
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.01	05/12/06	0.5 J	50.7
			05/13/06	0.6 J	27.4
			05/15/06	0.4 U+J	14.8
			05/19/06	0.2 U	13.6
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.01	05/12/06	0.2 J	4.0 J
			05/13/06	0.0 U	1.4 J
			05/15/06	0.2 U+J	1.4 J
			05/19/06	0.1 U	1.2 J
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	0.0003	05/12/06	8.4	414.0
			05/13/06	9.5	166.0
			05/15/06	11.6	100.0
			05/19/06	8.5 J	136.0
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	0.0003	05/12/06	0.9 J	101.0
			05/13/06	0.6 U	50.6
			05/15/06	1.2 J+U	27.7
			05/19/06	0.4 U	31.7

U: nondetect result

J: estimated result

+: combines qualifiers from replicate results

Table 3. March 2006 Wet Weather Sampling (3/10/06 - 3/12/06)
 Floodplain Sample Results (ng/Kg; ND = 1/2 DL)

CAS Number	Parameter Name	Study Area 1			Imerman Park			Shiawassee Wildlife Refuge			
		Reach	O	O	II	II	II	VV	VV	VV	
		Station	331+00	332+00	333+0	785+50	788+50	789+00	1168+00	1168+50	1167+50
		Proximity	NE-30	NE-390	NE-1670	NE-750	NE-325	N-30	S-2011	SW-555	SW-90
		GeoMorph Surface	High Terrace	Inter. Terrace	Low Terrace	Wetland	Low Terrace	Low Terrace	Low Terrace	Low Terrace	Low Terrace
		Location ID	FRE-03790	FRE-03791	FRE-03792	THT-03793	THT-03794	THT-03795	SHI-04567	SHI-04568	SHI-04569
		WHO 2005 TEF	nearest to river	middle	farthest from river	nearest to river	middle	farthest from river	nearest to river	middle	farthest from river
TEQ	TEQ		39.6		14.7	116.7	194.8	2.9	428.5	16.7	27.1
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	1.0	0.2 U		0.6 U	1.3 J	1.2 J	0.1 U	7.6	0.3 U	0.3 U
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	0.1	102		24.1	272	488	5.4	1030	32.7	55.2
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	1.0	0.3 U		0.4 U	1.7 J	1.6 J	0.1 U	9.0 J	0.4 U	0.5 U
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.03	47.4		13.3 J	135	225	2.8 J	491	20.2	34.2
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.3	39.5		13.3 J	121	206	2.7 J	430	16.2	26.3
39227-28-6	1,2,3,4,7,8-HEXAChLORODIBENZO-p-DIOXIN	0.1	0.8 J		0.5 U	0.8 U	1.3 J	0.2 U	5.9 J	0.6 U	0.9 J
70648-26-9	1,2,3,4,7,8-HEXAChLORODIBENZOFURAN	0.1	35.8		15 J	103	166	2.7 J	353	15.5	25.4
57653-85-7	1,2,3,6,7,8-HEXAChLORODIBENZO-p-DIOXIN	0.1	2.6 J		2.6 J	7	5.6 J	0.5 J	26.6	2.4 J	2.7 J
57117-44-9	1,2,3,6,7,8-HEXAChLORODIBENZOFURAN	0.1	8 J		4.1 J	20.4	36 J	0.8 J	73.6	5.2 J	7.4 J
19408-74-3	1,2,3,7,8,9-HEXAChLORODIBENZO-p-DIOXIN	0.1	1.4 J		1.7 J	2.5 J	2.3 J	0.2 U	10.4	0.6 U	1.6 J
72918-21-9	1,2,3,7,8,9-HEXAChLORODIBENZOFURAN	0.1	1.5 J		0.6 J	6.8 J	32.8	0.2 U	18.4	0.8 J	5.6 J
60851-34-5	2,3,4,6,7,8-HEXAChLORODIBENZOFURAN	0.01	5.4 J		2.8 J	13.5 J	13.7	0.5 J	31.5	3.1 J	4.4 J
35822-46-9	1,2,3,4,6,7,8-HEPTAChLORODIBENZO-p-DIOXIN	0.01	46.4		52.7	141	112	8.1	588	37.8	46.1
67562-39-4	1,2,3,4,6,7,8-HEPTAChLORODIBENZOFURAN	0.01	74		63.7	201	175	7.5	1030	36	52.3
55673-89-7	1,2,3,4,7,8,9-HEPTAChLORODIBENZOFURAN	0.01	5.0 J		2.5 J	15.5	16	0.2 U	52.6	5.5 J	4.7 J
3268-87-9	1,2,3,4,6,7,8,9-OCTAChLORODIBENZO-p-DIOXIN	0.0003	559		539	1400	1160	79	6300	390	459
39001-02-0	1,2,3,4,6,7,8,9-OCTAChLORODIBENZOFURAN	0.0003	120		96.2	451	326	13.1	1670	87.5	100

=: detected result

U: nondetect result

J: estimated result

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	<i>Reach</i>		K	K	K	K	K
	<i>Station ID</i>		223+50	223+50	223+50	223+50	223+50
	<i>Proximity</i>		NE-37	NE-88	NE-145	NE-192	NE-250
	<i>Geomorph Surface</i>		Inter. Terrace	Natural Levee	Low Terrace	Low Terrace	Wetland
	<i>CH ID</i>		MIC-03726	MIC-03727	MIC-03728	MIC-03729	
	<i>Location</i>		Caldwell	Caldwell	Caldwell	Caldwell	Caldwell
	<i>Turf Mat Retrieval Date</i>		3/28/06	3/28/06	3/28/06	3/28/06	
CAS Number	Parameter Name	WHO 2005 TEF	1	2	3	4	5
TEQ	TEQ		56.1	489.0	368.5	344.5	under water
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	1.0	2.0	10.3	11.9	12.4	
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	0.1	109	913	653	517	
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	1.0	1.9 J	13	19.8	22.2	
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	0.03	51.8	425	289	292	
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	0.3	50.6	383	261	241	
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	0.1	1.3 J	10.9	15.4	17.2	
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	0.1	70.4	584	479	486	
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	0.1	6.5	133	93.1	79.7	
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	0.1	13.6 J	106 J	93.4	97.6 J	
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.1	2.7	22.6	30.3	33.1	
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	0.1	1.9 J	14.7	8.7	12	
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	0.01	5.3	40.8	35.7	38.5	
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	0.01	118	3,430	2,150	1,640	
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	0.01	172 J	2,850 J	2,500 J	2,660 J	
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	0.01	17.9	365	164	133	
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	0.0003	1,220	28,900	22,200	18,200	
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	0.0003	373	11,000	6,460	5,030	

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Measurements (mm) <i>Clay Pad Measurement Date</i>	MIC-02319	MIC-02320	MIC-02321	MIC-02322	MIC-02323	
	4/13/06	4/13/06	4/13/06	4/13/06	4/13/06	
	Quadrant 1	45	2	no clay	5	under water
	Quadrant 2	no clay	10	1	12	
	Quadrant 3	no clay	1	5	no clay	
	Quadrant 4	18	no clay	2	50	

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	Reach	K	K
	Station ID	223+50	223+00
	Proximity	NE-382	NE-616
	Geomorph Surface	Wetland	Upland
	CH ID		MIC-03732
	Location	Caldwell	Caldwell
	Turf Mat Retrieval Date		3/28/06
CAS Number	Parameter Name	6	7
TEQ	TEQ	under water	25.1
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN		7.8
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN		3.3
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN		8.8
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN		2.2 J
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN		2.9
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN		3.7
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN		5.6
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN		11.4
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN		3.7
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN		7.1
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN		2.0 J
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN		3.1
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN		178
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN		91.8
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN		4.4
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN		1,720
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN		226

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Method	MIC-02324	MIC-02325
Clay Pad Method	4/13/06	4/13/06
		no clay
		under water
		0
		12
		10

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	Reach	P	P	P	P	P	P
	Station ID	335+50	335+50	335+50	335+50	335+50	335+50
	Proximity	NE-50	N-108	NE-160	NE-206	NE-309	NE-402
	Geomorph Surface	Natural Levee	Inter. Terrace	Inter. Terrace	Low Terrace	Inter. Terrace	Inter. Terrace
	CH ID	FRE-03733	FRE-03734	FRE-03735	FRE-03736	FRE-03737	FRE-03738
	Location	Area #1	Area #1	Area #1	Area #1	Area #1	Area #1
	Turf Mat Retrieval Date	3/28/06	3/28/06	3/28/06	3/28/06	3/28/06	3/28/06
CAS Number	Parameter Name	1	2	3	4	5	6
TEQ	TEQ	132.5	631.1	506.2	510.8	375.5	302.3
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	3.4	31.3	7.1	6.8	4.8	4.9
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	389	1,430	1,140	1,270	845	611
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	2.5	10.2	8.81	15.2	6.7	8.1
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	103	698	532	544	431	339
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	120	591	486	480	380	294
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	1.6 J	6.5	6.6	12.1	4.9	6.2
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	113	668	542	500	380	343
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	10.5	43.1	47	49.7	24.5	31.5
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	24.1 J	125 J	108 J	95.9 J	76.4 J	67.2 J
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	3	12	13.7	23.4	10.6	12.3
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	2.3 J	12.1	10.9	9.6	8.3	7.2
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	7.55	40.7	36.3	35.5	29.1	25.2
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	226	923	1,440	889	507	623
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	354 J	1,380 J	1,280 J	1,090 J	809 J	738 J
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	26	121	105	106	51.3	64.1
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	2,150	9,120	15,300	8,500	4,930	5,780
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	977	2,990	4,630	2,400	1,460	1,810

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Method	FRE-02353	FRE-02354	FRE-02355	FRE-02356	FRE-02357	FRE-02358
Clay Pad M	4/4/06	4/4/06	4/4/06	4/4/06	4/4/06	4/4/06
	no clay	10	2	40	2	no clay
	no clay	10	1	40	mixed	mixed
	20	mixed	mixed	0	0	mixed
	10	10	mixed	5	2	no clay

Study Area 1 field was disced in Fall 2005

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	Reach	P	P	P	P	P
	Station ID	335+50	335+50	335+50	335+50	335+50
	Proximity	NE-613	NE-811	NE-1193	NE-1630	NE-2124
	Geomorph Surface	Low Terrace	Low Terrace	Wetland	Low Terrace	Inter. Terrace
	CH ID	FRE-03739	FRE-03740	FRE-03741	FRE-03742	FRE-03743
	Location	Area #1	Area #1	Area #1	Area #1	Area #1
	Turf Mat Retrieval Date	3/28/06	3/28/06	3/28/06	3/28/06	3/28/06
CAS Number	Parameter Name	7	8	9	10	11
TEQ	TEQ	273.4	145.0	141.2	77.1	10.5
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	6.0	5.5	7.1	4.6	2.2
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	549	267	228	129	3.7
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	9.6	6.5	7.6	4.3	1.9 J
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	297	146	129	67.6	2.5 J
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	266	131	116	64.9	3.7 J
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	7.1	5	5.9	3.4 J	2.3 J
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	282	152	159	77.1	4.1 J
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	28.3	19.8	25.6	12.1	5.1 J
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	58.8 J	32.8 J	32.8 J	17.1 J	2.2 J
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	14	10	11.7	6.2	3.8 J
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	6.2	3.6	4.8	3.1	1.0 J
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	24.5	14.6	14.6	8.6	2.9 J
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	465	391	549	254	128
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	732 J	495 J	730 J	380 J	39.3
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	42	27.3	33.4	15.1	2.7 J
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	4,320	3,920	5,660	2,760	2,000
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	1,220	924	1,340	602	127

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Month	FRE-02359	FRE-02360	FRE-02361	FRE-02362	FRE-02363
Clay Pad Month	4/4/06	4/4/06	4/4/06	4/4/06	4/4/06
	no clay	no clay	0	no clay	no clay
	no clay	no clay	0	no clay	no clay
	1	no clay	8	no clay	no clay
	no clay	no clay	4	no clay	no clay

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	<i>Reach</i>	V 474+50	V 474+50	V 474+50	V 474+00	V 473+50	V 473+00
	<i>Station ID</i>	SE-70	SE-127	S-157	SE-198	SE-293	SE-496
	<i>Proximity</i>	High Terrace	High Terrace	High Terrace	High Terrace	Inter. Terrace	Inter. Terrace
	<i>Geomorph Surface</i>						
	<i>CH ID</i>	FRE-03744		FRE-03746	FRE-03747	FRE-03748	FRE-03749
	<i>Location</i>	Festival	Festival	Festival	Festival	Festival	Festival
	<i>Turf Mat Retrieval Date</i>	3/28/06		3/28/06	3/28/06	3/28/06	3/28/06
CAS Number	Parameter Name	1	2	3	4	5	6
TEQ	TEQ	5,119.80	Insufficient	921.9	1,414.6	1,859.4	930.9
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	5.9	Material	5.9	5.8	19.0	5.2
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	14,900	Deposited	2,390	3,540	5,530	2,510
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	6.65 U		8.4	9.3	25.9	8.1
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	5,870		1,040	1,640	1,880	1,050
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	5,640		967	1,550	1,900	1,000
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	4.74		6	6.6	16.3	5.3
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	3,740		807	1,230	1,290	733
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	22.8		35.7	35.2	63.2	22.6
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	698 J		164 J	244 J	261 J	151 J
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	8.91		12.4	13.4	28.1	9.6
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	78.2		17.9	25.1	29.3	18
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	290		64	96.5	111	60.9
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	516		788	801	1,470	576
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1,160 J		1,260 J	1,320 J	1,980 J	704 J
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	197		88.2	107	130	55.4
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	5,570		7,970	9,590	14,800	5,320
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	1,560		2,550	2,620	3,550	1,440

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

<i>Corresponding Clay Pad Deposition Method</i>	FRE-02339	FRE-02340	FRE-02341	FRE-02342	FRE-02344	FRE-02345
<i>Clay Pad Method</i>	4/13/06	4/13/06	4/13/06	4/13/06	4/13/06	4/13/06
	no clay	clay pad destroyed	4	--	no clay	no clay
	no clay		no clay	--	no clay	mixed
	11		no clay	15	no clay	no clay
	no clay		2	2	18	25

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	<i>Reach</i> <i>Station ID</i>	II 812+00	II 812+00	II 812+00	II 812+00	II 812+50	II 811+50	II 811+50
	<i>Proximity</i>	NE-52	NE-71	NE-203	N-312	N-533	NE-1010	NE-1430
	<i>Geomorph Surface</i>	Inter. Terrace	Inter. Terrace	Inter. Terrace	Low Terrace	Low Terrace	Wetland	Wetland
	<i>CH ID</i>	THT-03750	THT-03751	THT-03752	THT-03753	THT-03754		THT-03756
	<i>Location</i>	Imerman	Imerman	Imerman	Imerman	Imerman	Imerman	Imerman
	<i>Turf Mat Retrieval Date</i>	3/30/06	3/30/06	3/30/06	3/30/06	3/30/06		3/30/06
CAS Number	Parameter Name	1	2	3	4	5	6	7
TEQ	TEQ	1,177.6	813.6	762.9	790	934.8	under water	1,049.30
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	12.2	12.1	8.5	8.0	10.0		13.4
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	3,910	2,090	2,050	2,170	2,250		2,620
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	16	15.7	11.4	13	14.6		20.8
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	1,230	954	888	938	1,140		1,120
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	1,090	779	745	744	939		1,080
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	7.8	8.4	6.9	5.7	8.9		12.1
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	907	781	708	719	920		913
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	49.3	66.3	39.4	76.5	50.5		49.5
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	193 J	174	149	154	195		194 J
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	16.6	20.9	13.8	14.5	17.8		19.1
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	19.9	20.5	16	15.7	20.4		18.2
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	75.6	65.6	57.6	63.1	75.9		78.1
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	900	965	800	1,230	1,000		1,010
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1,400 J	1,420	1,220 J	1,380 J	1,760 J		1,620 J
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	97.4	94.2	93.8	97.8	105		115
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	8,040	8,590	7,300	8,560	9,550		10,000
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	2,500	2,570	2,430	3,140	3,050		2,820

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Mea Clay Pad M	THT-02317	THT-02310	THT-02318	THT-02311	THT-02313	THT-02313	THT-02314
	4/4/06	4/4/06	4/4/06	4/4/06	4/4/06	4/4/06	4/4/06
	mixed	no clay	no clay	20	2	under water	mixed
	--	no clay	no clay	3	2		mixed
	--	70	7	mixed	25		mixed
	--	mixed	6	1	mixed		mixed

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	Reach	II	II
	Station ID	811+00	810+00
	Proximity	NE-1750	NE-1898
	Geomorph Surface	Wetland	High Terrace
	CH ID		THT-03758
	Location	Imerman	Imerman
	Turf Mat Retrieval Date		3/30/06
CAS Number	Parameter Name	8	9
TEQ	TEQ	Insufficient	55.4
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	Material	1.1
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	Deposited	112
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN		1.6 J
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN		58.1
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN		52.5
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN		1.2 J
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN		55.8
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN		5
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN		11.8
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN		2.6
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN		1.4 J
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN		6.2
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN		119
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN		247
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN		8.5
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN		1,260
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN		330

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Method	THT-02315	THT-02316
Clay Pad Method	4/4/06	4/4/06
	no clay	no clay
	no clay	2
	mixed	no clay
	--	no clay

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	Reach	UU	UU	UU	UU	UU
	Station ID	1133+50	1133+50	1133+00	1133+00	1132+50
	Proximity	N-58	N-108	NE-157	NE-200	NE-233
	Geomorph Surface	Low Terrace	Low Terrace	Low Terrace	Low Terrace	Upland
	CH ID	SHL-03759	SHL-03760	SHL-03761		
	Location	Landfill	Landfill	Landfill	Landfill	Landfill
	Turf Mat Retrieval Date	4/3/06	4/3/06	4/3/06		
CAS Number	Parameter Name	1	2	3	4	5
TEQ	TEQ	1738.4	555.7	165.7	Insufficient	Insufficient
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	5.7	5.0	1.7	Material	Material
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	5,380	1,450	398	Deposited	Deposited
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	3,825 U	6.4	2.5 J		
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	1,830	645	185		
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	1,850	562	175		
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	3.3	3.4	1.7 J		
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	1,180	467	147		
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	19.1	27.6	7.6		
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	233	103	31.6		
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	7	7.4	3.6		
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	24.4	10.8	2.4 J		
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	102	40.7	13		
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	345	747	152		
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1,280	1,110 J	244		
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	74.3	53.8	15.6		
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	3,640	7,180	1,500		
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	1,380	2,600	403		

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Method	SHL-02326	SHL-02327	SHL-02328	SHL-02329	SHL-02330
	Clay Pad M	4/11/06	4/11/06	4/11/06	4/11/06
	10	no clay	8	mixed	2
	25	no clay	14	0	0
	no clay	no clay	15	0	10
	12	3	4	2	20

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	Reach	VV	VV	VV	VV	VV	VV
	Station ID	1167+50	1167+50	1167+50	1167+50	1168+00	1168+00
	Proximity	S-57	SE-122	SE-175	SE-215	SE-521	SE-1031
	Geomorph Surface	Inter. Terrace					
	CH ID	SHI-03764	SHI-03765	SHI-03766	SHI-03767	SHI-03768	SHI-03769
	Location	Shiawassee	Shiawassee	Shiawassee	Shiawassee	Shiawassee	Shiawassee
	Turf Mat Retrieval Date	4/3/06	4/3/06	4/3/06	4/3/06	4/3/06	4/3/06
CAS Number	Parameter Name	1	2	3	4	5	6
TEQ	TEQ	50.7	143.6	648.1	745.1	670.6	84.800
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	6.3	3.2	3.2	6.1	4.4	1.3
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	106	437	1,740	1,850	1,600	184
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	1.1 J	3.2	4.5	6.8	8.8	1.8 J
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	50.5	127	725	961	829	99.1
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	44.7	133	719	799	684	86.7
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	0.5 J	1.8 J	2.4 J	4	5.2	1.4 J
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	44.9	101	452	648	659	78.3
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	2.3 J	8.7	13.3	20.4	33.2	5.9
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	10.4	22.6	107 J	131	134 J	16.8
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	0.9 J	3.5	5.3	8.3	11.2	2.6 J
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	1.1 J	2.9	10.8	15.8	15.5	1.8 J
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	3.6	9.2	48.5	48.5	52.3	7
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	43.6	203	221	402	726	128
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	91.7	323	387	699	1,400	200
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	5.3	15.3	34.9	61.9	72.5	10
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	569	2,100	2,020	3,780	6,650	1,330
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	159	552	646	1,110	2,460	331

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Method	SHI-02330	SHI-02332	SHI-02333	SHI-02334	SHI-02335	SHI-02336
	Clay Pad M	4/11/06	4/11/06	4/11/06	4/11/06	4/11/06
	no clay	no clay	20	no clay	2	30
	no clay	29	10	no clay	3	mixed
	no clay	17	17	no clay	---	0
	no clay	10				

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	<i>Reach</i>	VV	VV
	<i>Station ID</i>	1167+00	1166+00
	<i>Proximity</i>	SE-2020	SE-3031
	<i>Geomorph Surface</i>	Inter. Terrace	Inter. Terrace
	<i>CH ID</i>		SHI-03771
	<i>Location</i>	Shiawassee	Shiawassee
	<i>Turf Mat Retrieval Date</i>		4/3/06
CAS Number	Parameter Name	7	8
TEQ	TEQ	under water	97.200
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN		2.4
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN		203
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN		3.1
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN		112
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN		89.4
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN		2.7 J
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN		96.1
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-p-DIOXIN		10.5
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN		22.3
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-p-DIOXIN		5.2
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN		3.4
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN		8.4
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN		284
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN		282
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN		17.3
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN		2,820
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN		701

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Method	Clay Pad Material	SHI-02337	SHI-02338
		4/11/06	4/11/06
			13
			no clay
			10
			no clay

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	Reach	YY	YY	YY	YY	YY	YY	YY
	Station ID	1265+50	1265+50	1265+50	1265+50	1266+00	1266+00	1266+50
	Proximity	NE-71	NE-120	NE-172	NE-226	N-320	NE-416	NE-607
	Geomorph Surface	Low Terrace	Low Terrace	Low Terrace	Inter. Terrace	Inter. Terrace	Inter. Terrace	Inter. Terrace
	CH ID	SHI-03777	SHI-03778	SHI-03779		SHI-03781		SHI-03783
	Location	DNR	DNR	DNR	DNR	DNR	DNR	DNR
	Turf Mat Retrieval Date	3/30/06	3/30/06	3/30/06		3/30/06		3/30/06
CAS Number	Parameter Name	1	2	3	4	5	6	7
TEQ	TEQ	1,596.9	1,670.7	598.5	Insufficient	70.8	Insufficient	40.6
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	12.1	11.2	4.9	Material	0.2 U	Material	0.3 J
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	4,090	3,760	1,430	Deposited	175	Deposited	96.2
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	24.3	36.2	12.3		1.2 J		0.5 J
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	1,740	1,780	644		88.9		49.2
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	1,660	1,690	616		72.8		42.3
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	12.3	19.9	7.34		0.2 U		0.5 J
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	1,300	1,510	512		70.2		41.8
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	62.2	145	34		1.9 J		1.0 J
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	300	339	114 J		14.8		9
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	23	38.3	16.3		0.6 U		0.7 J
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	28.9	38.6	14.3		2.7 J		1.0 J
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	117	142	50		7.7 J		3.8
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	1,320	2,590	597		32.1		17.7
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	3,360 J	5,870 J	1,600 J		89.3		63.7
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	142	224	56.2		6.4 J		3.3 J
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	15,000	24,000	5,700		301		186
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	4,190	8,220	1,710		92.2		58.4

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Method	SHI-02364	SHI-02365	SHI-02367	SHI-02366	SHI-02369	SHI-02368	SHI-02370
	Clay Pad M	4/5/06	4/5/06	4/5/06	4/5/06	4/5/06	4/5/06
	mixed	0	mixed	0	no clay	2	no clay
	no clay	no clay	5	0	no clay	---	no clay
	mixed	0	no clay	0	no clay	25	no clay
	20	no clay	no clay	0	no clay	no clay	no clay

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	<i>Reach</i>	YY	YY	YY
	<i>Station ID</i>	1267+00	1269+00	1274+00
	<i>Proximity</i>	NE-800	N-1220	NE-1504
	<i>Geomorph Surface</i>	Inter. Terrace	Low Terrace	Wetland
	<i>CH ID</i>			
	<i>Location</i>	DNR	DNR	DNR
	<i>Turf Mat Retrieval Date</i>			
CAS Number	Parameter Name	8	9	10
TEQ	TEQ	Insufficient	under water	under water
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	Material		
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	Deposited		
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN			
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN			
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN			
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN			
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN			
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN			
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN			
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN			
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN			
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN			
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN			
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN			
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN			
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN			
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN			

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Month	SHI-02371	SHI-02372	SHI-02373
Clay Pad Month	4/5/06	4/5/06	4/5/06
	no clay		
	8		
	no clay	under water	under water
	no clay		

Table 4. Turf Mat Sample Results (ng/Kg; ND = 1/2 DL)

	<i>Reach</i>	YY 1266+00	YY 1266+00	YY 1266+50	YY 1267+00	YY 1267+00
	<i>Station ID</i>	SE-71	SE-106	SE-390	SE-655	SE-739
	<i>Proximity</i>					
	<i>Geomorph Surface</i>	Low Terrace	Low Terrace	Inter. Terrace	Inter. Terrace	Inter. Terrace
	<i>CH ID</i>	SHI-03772	SHI-03773	SHI-03774	SHI-03775	SHI-03776
	<i>Location</i>	Greenpoint	Greenpoint	Greenpoint	Greenpoint	Greenpoint
	<i>Turf Mat Retrieval Date</i>	3/30/06	3/30/06	3/30/06	3/30/06	3/30/06
CAS Number	Parameter Name	1	2	3	4	5
TEQ	TEQ	465.7	420.8	395.8	471.4	458.7
1746-01-6	2,3,7,8-TETRACHLORODIBENZO-p-DIOXIN	8.4	7.2	6.3	6.6	5.4
51207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	1,020	916	884	1,270	1,120
40321-76-4	1,2,3,7,8-PENTACHLORODIBENZO-p-DIOXIN	10.6	9.5	8.7	8	9.1
57117-41-6	1,2,3,7,8-PENTACHLORODIBENZOFURAN	489	464	429	513	552
57117-31-4	2,3,4,7,8-PENTACHLORODIBENZOFURAN	483	436	409	474	474
39227-28-6	1,2,3,4,7,8-HEXACHLORODIBENZO-p-DIOXIN	5.39	5.3	5.3	4.8	4.9
70648-26-9	1,2,3,4,7,8-HEXACHLORODIBENZOFURAN	407	378	343	363	397
57653-85-7	1,2,3,6,7,8-HEXACHLORODIBENZO-P-DIOXIN	35.2	27.1	27	27.7	23.5
57117-44-9	1,2,3,6,7,8-HEXACHLORODIBENZOFURAN	94.3 J	84.7 J	71.8	81.3 J	83.2
19408-74-3	1,2,3,7,8,9-HEXACHLORODIBENZO-P-DIOXIN	12.1	10.9	11.1	10.6	9.7
72918-21-9	1,2,3,7,8,9-HEXACHLORODIBENZOFURAN	11.7	9.8	7.8	7.9	9.6
60851-34-5	2,3,4,6,7,8-HEXACHLORODIBENZOFURAN	39.1	36.6	29.7	32.8	33.1
35822-46-9	1,2,3,4,6,7,8-HEPTACHLORODIBENZO-p-DIOXIN	588	500	622	455	357
67562-39-4	1,2,3,4,6,7,8-HEPTACHLORODIBENZOFURAN	1,110 J	1,000	952	869 J	704 J
55673-89-7	1,2,3,4,7,8,9-HEPTACHLORODIBENZOFURAN	51.6	45.3	44.7	42.3	40.2
3268-87-9	1,2,3,4,6,7,8,9-OCTACHLORODIBENZO-p-DIOXIN	5,990	5,200	5,600	4,320	3,480
39001-02-0	1,2,3,4,6,7,8,9-OCTACHLORODIBENZOFURAN	1,790	1,440	1,470	1,320	1,040

U: nondetect result

J: estimated result

Blank cell: insufficient sediment mass for analysis

Corresponding Clay Pad Deposition Mean	SHI-03772	SHI-03773	SHI-03774	SHI-03775	SHI-03776
	<i>Clay Pad M</i>	4/5/06	4/5/06	4/5/06	4/5/06
	3	8	no clay	---	no clay
	20	no clay	no clay	no clay	no clay
	30	no clay	no clay	no clay	no clay
	10	25	no clay	---	0